There are many different ways to protect a computer against virus attacks. The electronic removable disk presented here is an especially reliable approach.

Design by H. Kraus

an electronic removable disk

virus protection using two hard disks

When a computer is used by more than one person, virus protection is doubly difficult. For example, if your offspring frequently install games or programs of obscure origin on your home work station PC, it shouldn't take too long for viruses to start flexing their muscles in your computer and damaging important system files. Even if you diligently run a virus scanner or employ a boot manager, which allows an alternate system to be booted from a different partition or drive, you cannot be assured of 100 percent protection. Seemingly, the only truly secure solution would be to use a removable disk. However, even this approach has a serious disadvantage, in that unintentionally switching off or swapping the disk while the system is running will unavoidably result in hardware and software faults.

The switch mechanism

A circuit for switching disks off line is described in the April 1999 issue of *Elektor Electronics*. This can naturally be used to switch between two hard disk drives, so that the computer can be booted from physically separate system disks. This circuit is ideal for older-model drives, but it does not work with new models. These communicate

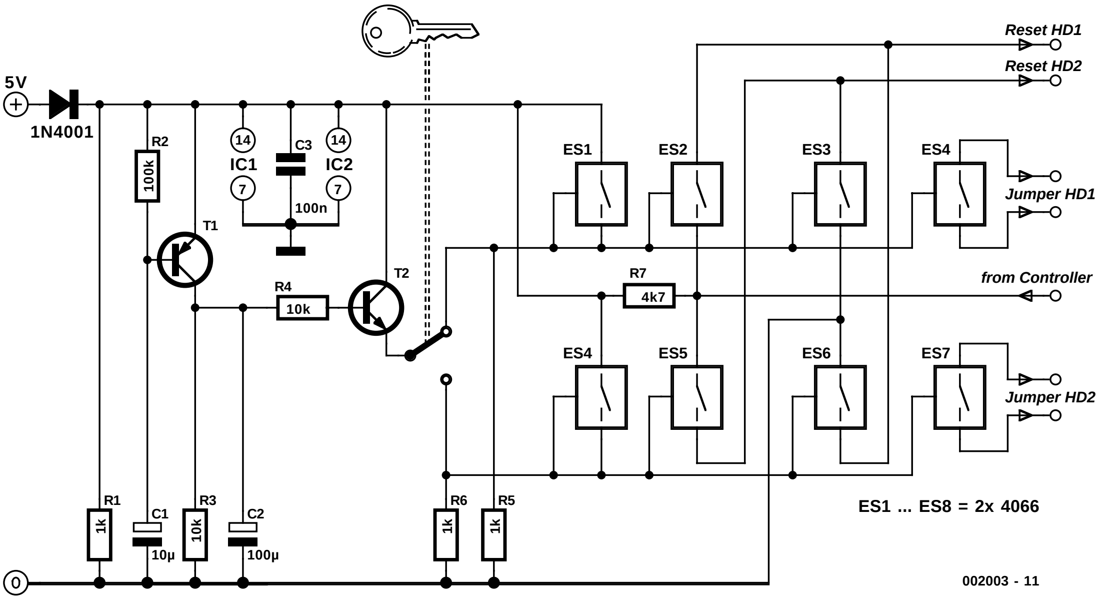

Figure 1. The power-on pulse enables one of the two hard-disk drives, depending on the position of the switch.

with each other via the $\overline{\text{DASP}}$ line, and this can cause the interface to lock up if a drive is switched off line. However, this problem can easily be solved by designating the off-line drive as a slave drive and breaking the $\overline{\text{DASP}}$ line between the drives. This works with all hard disk drives, drive controller boards and operating systems that have been tested by the author.

In addition, you must make sure that it is not possible to accidentally switch over the disks while the system is running, since this would result in a data catastrophe — a total loss of data.

The circuit described here fulfils two functions. The portion around T1 and T2 amounts to a sort of power-on reset circuit. Transistor T1 is normally blocked, since its base is connected to its emitter via R2. However, C1 charges via R2 when power is first applied, and the voltage drop across R2 switches T1 on for a short time. The full supply voltage is thus briefly applied to C2 during the power-up interval. The resulting power-on pulse is available at the emitter of T2, which has a low output impedance. This pulse can be connected to a key switch or an unused turbo switch (for example), as desired. The emitter resistors for T2, R5 and R6, also hold the control inputs of the electronic switches low when the mechanical switch is open.

Now we come to the second part of the circuit. The first two 4066 switches are latching, which means that they hold their states after the power-on pulse has occurred — either open or closed, depending on the position of the switch. These two switches control the remaining three pairs of switches, which look after enabling and disabling the disk drives. Two pairs of switches enable the selected drive and place the non-selected drive off line, while the remaining pair of switches replaces the master/slave jumpers of the drives. The jumper assignments can usually be determined by examining the component labels on the drive's circuit board; otherwise, you will have to consult the manual.

Since the power-on circuit generates a pulse only when the power is switched on, nothing will happen if the key switch is turned while the system is running. A disk changeover will only occur following the next hardware reset, or after the computer has been switched off and on again. As a final remark, note that either the two hard disk drives must be the same type and model, or the option 'MODE = AUTO' must be enabled in the BIOS for the primary master drive.

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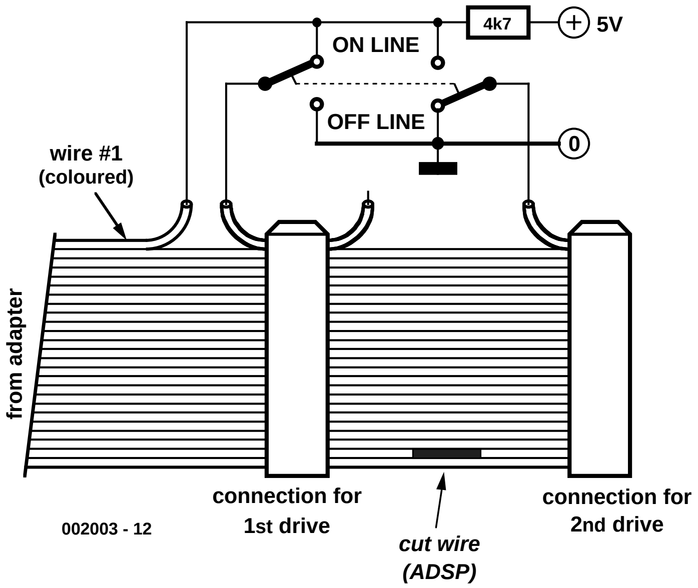

Figure 2. The DASP/ line must be cut.